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BISNIS Search for Partners – Leads from the BioIndustry Initiative

**INDUSTRY: MEDICAL
EQUIPMENT AND
PRODUCTS,
PHARMACEUTICALS,
HEALTH CARE
SERVICES**

**COMPANY /
INSTITUTE:**

JSC Biochimash, Moscow
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COUNTRY: Russian
Federation

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PLANT CELL CULTURE TECHNOLOGY FOR THE PRODUCTION OF THE ANTICANCER DRUG - PACLITAXEL

ABSTRACT: Paclitaxel, a member of the "taxanes" (diterpene alkaloid) family of plant-derived compounds, is the biologically active ingredient of anti-cancer agents for the treatment of breast, ovarian, lung cancer, Kaposi's sarcoma and others. In the Russian Federation, this compound is currently not being produced because of the lack of the initial raw material, i.e., yew trees. The estimated Russian market for this drug is over \$20 million per year. We have determined that biosynthesis in plant cell culture is the technique of choice as opposed to total synthesis because the latter is both very expensive and has low product yields. JSC "Biochimash" is now developing technology to manufacture Paclitaxel by plant cell biotechnology. Purified Paclitaxel from plant cell culture possesses the same characteristics as the substance produced from the intact plants.

Advantages of the Biochimash Technology for the Production of Paclitaxel:

- Self-sufficiency of initial raw materials;
- Increased rates of target compound biosynthesis in cells as compared to natural plants (several weeks instead of several years);
- Independence of production processes from environmental conditions (seasonal, weather, diseases, insects, etc.);
- Absence of pollutants in the initial raw materials, such as, pesticides, insecticides, heavy metals, among others; and
- Consistency and Reliability of the production and more efficient Quality Control of the product.

OTHER INFORMATION

Institute representatives will be attending BIO2006 (Chicago, April 9 – 12, 2006) and welcome the opportunity to meet with interested parties during the event. For more information:

<http://www.biistate.net/docs/bio2006.php> or email: EurasiaBio2006@biistate.net

TYPE OF PARTNERSHIP OFFERED: Biochimash is seeking investment and partnership from western industry for plant cell culture production.

COMPANY / INSTITUTE ROLE: Licensing and product development partnership.

CURRENT STATE OF DEVELOPMENT: Pilot-scale.

INTELLECTUAL PROPERTY STATUS: Biochimash's proprietary method and devices for plant cell culture production have been protected as confidential information and may be protectable worldwide through patenting.

ABOUT COMPANY / INSTITUTE: Biochimash specializes in research, development and production in the following areas: phytomedicine and veterinary products, environmental protection and remediation, plant protection, disease control, and plant growth stimulators. In addition, Biochimash is pioneering basic and applied space biotechnology, and specialized equipment for biological research. Established in April 1974, Biochimash has provided two critical functions to the innovation cycle: the scale-up of laboratory developments to industrial scale and production based on these novel techniques. The staff includes 200 highly qualified specialists with an extensive publication record and multiple patents.

Research and development activities at Biochimash are focused on:

- Development of novel medical, veterinary, agricultural and environmental preparations;
- Production technologies;
- New equipment for the production of medical, microbiological, agricultural and chemical products.

MEDICAL APPLICATIONS

- Anti-fungal and wound healing ointment based on shikonin, produced from plant cell culture.
- Biologics from cell cultures of the *Stephania glabra* plant to treat nervous system disorders.
- Degradable bioplastics (hydroxybutyrate-hydroxyvalerate copolymers)
- Biocompatible and biodegradable poly-oxyl-alconoates for various applications: drug delivery, resorptive seaming material, material for implantation of vessels, film coatings and burn surfaces, tissue engineering and the manufacturing of disposable objects and non-woven materials.

- Production methodology for the biodegradable thermoplastic biopolymer- hydroxybutyrate.
- A cure for male sterility and impotence based on Leidig's cells.

AGRICULTURAL BIOTECHNOLOGY

- Microbial plant protection products to control various pathogens, as well as insects and pests of fruit trees, bushes and vegetables.
- Plant growth stimulants that increase the speed of sprouting and biomass by up to 60 percent.
- Veterinary protein-vitamin feed additives to strengthen the animal's immune system and improve fur-skin conditions.
- Biologically active supplements for livestock and poultry feed, resistance to disease and productivity.

MAJOR CUSTOMERS / INTERNATIONAL

EXPERIENCE: Biochimash has an established track record of international collaboration with the U.S. Department of Energy, NASA and the ISTC, among others. Biochimash provides a well-developed biotechnology program with novel technologies in several areas, which are of interest to U.S. and Western pharmaceutical and other sectors of biotechnology.

PARTNERSHIP OPPORTUNITIES FROM BII. The BioIndustry Initiative (BII) is a nonproliferation program of the US Department of State's Bureau of International Security and Nonproliferation - Office of Cooperative Threat Reduction (ISN-CTR). BII's mission is to counter the threat of bioterrorism through targeted transformation of former Soviet biological weapons research and production capacities.

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